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SIXTH TOPICAL MEETING ON EMERGENCY PREPAREDNESS AND RESPONSE

ARAC III, A New Generation Emergency Response Modeling System

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The Atmospheric Release Advisory Capability (ARAC) program has provided real-time, world-wide, emergency reponse service for the Department of Energy (DOE) for almost two decades. Over the past ten years, ARAC has evolved from a service that supported exclusively nuclear-related emergencies into one capable of providing advisory to a wide range of accidents and potential accidents involving hazardous materials. During this period of time, the ARAC models have undergone a number of incremental changes so that an increasing variety of accident scenarios can be simulated. However, since the majority of the codes were developed during the early 1980's, these models have not been taken advantage of the state-of-the-art technologies that are currently available. In 1995, ARAC management, supported by DOE, embarked on a program to upgrade ARAC with the latest hardware and software platforms. The new models will enable ARAC to respond to the variety of emergencies that will emerge during the next decade, and beyond.

ARAC III is a real-time, operational system that is being developed to replace the current ARAC II system. When completed, the new system will provide vastly improved emergency response service to both DOE and DOD agencies. Among the important new features of the ARAC III are: (I) A prognostic forecast model to generate meteorological fields and to supplement the wind fields obtained by the diagnostic models; (ii) New diagnostic and dispersion models that are based on continuous-varying terrain; (iii) Avariety of new meteorological and geographic input data sources; (iv) UNIX-based distributed computational platforms; (v) A suite of new research and graphical tools to support meteorological research. The ARAC III system will be developed with the new software technologies such as FORTRAN 90, C++, and netCDF protocols. It is anticipated that an initial ARAC III system will be in place by 1997 with full operational capabilites by the year 2000.

The focus of this paper is to provide an overview of the ARAC III modeling system. In particular we will describe the important capabilities of the new system and the basic features of the prognostic and diagnostic models that drive the new dispersion model. Some preliminary results from the models will also be presented

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